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The local costs of biodiversity offsets: Comparing standards, policy and practice

Cécile Bidaud[a,1], Kate Schreckenberg[b], Julia P.G. Jones[a,*]

[a] School of Environment, Natural Resources and Geography, Bangor University, Bangor, Gwynedd, LL57 2UW, United Kingdom
[b] Department of Geography, Kings College London, London, WC2R 2LS, United Kingdom

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ABSTRACT

Biodiversity offsets seek to counterbalance loss of biodiversity due to major developments by generating equivalent biodiversity benefits elsewhere, resulting, at least in theory, in 'no net loss' (or even a 'net positive gain') in biodiversity. While local costs of major developments themselves receive significant attention, the local costs of associated biodiversity offsets have not. In low income countries, where local populations often depend heavily on natural resources and access to land for their livelihoods, the conservation restrictions introduced around biodiversity offsets can have significant local costs. We consider the international standards which underpin the development of biodiversity offsets around the world and look at the biodiversity offset programme of the Ambatovy nickel mine in eastern Madagascar: a company at the vanguard of biodiversity offset development. Using document review and interviews with key international and national stakeholders (as well as previous fieldwork on local impacts of the Ambatovy biodiversity offset) we identify a mismatch between policies which make clear commitments to avoiding harm to local people, and somewhat weaker implementation on the ground. We explore this policy-practice gap and suggest that it is due to: 1) different interpretations of the meaning of international standards, 2) weak incentives for companies to comply with policies, 3) separation of responsibilities for social and environmental impacts of interventions in operating companies, 4) assumptions that conservation is a 'good thing' causing reduced scrutiny of biodiversity offsets relative to other activities of major developments. Biodiversity offsets are resulting in a rapid increase in protected areas funded by corporations (and their international lenders). Many conservation projects in low income countries have local costs. The existence of stringent standards which recognise these costs in the case of biodiversity offset projects is very positive. Biodiversity offsets have the potential to be a successful addition to the conservationist's toolkit but the real challenges of addressing the local costs of this novel conservation approach need to be resolved.

1. Introduction

Biodiversity offsets seek to compensate for the damage to biodiversity caused by developments such as mines, dams or roads by creating an 'ecologically equivalent' benefit elsewhere (Quétier and Lavorel, 2011). They are seen as a mechanism to allow economically important infrastructure which can contribute to human development to be built while ensuring, at least in theory, that 'no net loss', or even 'net positive gain', in biodiversity is achieved (Bull et al., 2013; Gardner et al., 2013; Maron et al., 2016a,b). Their use is rapidly expanding, with many countries having national level policies (Maron et al., 2016a,b; IUCN, The Biodiversity Consultancy, 2018) and a growing number of companies having made voluntary commitments to offset their unavoidable biodiversity impacts (Rainey et al., 2015). Lender requirements are also increasingly driving their use: since 2012 offsets have been mandated wherever a development financed by institutions applying International Finance Corporation standards affects an area of high biodiversity importance (IFC, 2012a, p2 PS6). Despite this rapid spread, their use remains controversial (Ives and Bekessy, 2015).

There is a sizable academic literature focusing on the challenges of ensuring that biodiversity offsets deliver on their promises in terms of biodiversity conservation itself (Bull et al., 2015; Bull et al., 2017; Curran et al., 2014; Maron et al., 2015a; Maron et al., 2015b; Virah-Sawmy et al., 2014; Watson et al., 2010). However, biodiversity offsets also pose important social challenges. There has been criticism that they fail to take account of the unique, place-based values which sites may hold; instead treating sites as equivalent if their biodiversity values, as defined by experts, are equivalent (Hannis and Sullivan, 2012;

* Corresponding author at: School of Environment, Natural Resources and Geography, Bangor University, Bangor, Gwynedd, LL57 2UW, United Kingdom.
E-mail addresses: kate.schreckenberg@kcl.ac.uk (K. Schreckenberg), julia.jones@bangor.ac.uk (J.P.G. Jones).
[1] Permanent address: Is'art Galerie/Lot VC 59Q Rue Vittori François 101 Antananarivo.

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Ives and Bekessy, 2015; Robertson, 2000; Scholte et al., 2016). There is also a rich and rapidly growing literature critiquing the concept of biodiversity offsets from the perspective of political economy; emphasising the equity implications of the distributions of the new environmental values which biodiversity offsets create through the commodification of nature (Neimark and Wilson, 2015; Robertson, 2000, 2004, 2011; Sullivan, 2013; Sullivan and Hannis, 2015; Vaissière et al., 2017). For example, where threats to biodiversity come from the livelihood activities of poor local stakeholders such as agricultural expansion, hunting or wild-product harvesting (as is often the case in low income countries) biodiversity offsets which seek to reduce these threats will bring local costs (Kraemer, 2012; Seagle, 2012; Bidaud et al. 2017). In fact a recent study suggests that a third of offsets displace people and negatively affect livelihoods (Sonter et al., 2018). Such local costs of conservation-related land use restrictions are well recognised in the context of protected areas (Brockington and Wilkie, 2015; Holmes and Cavanagh, 2016; Oldekop et al., 2016), but the extent to which biodiversity offset schemes consider and mitigate the local costs of their conservation activities has not been extensively studied.

A company carrying out a major infrastructure development, as well as following its own company policy and the laws of the country, will have to follow the standards set by its lender. The performance standards of the International Finance Corporation (IFC) are increasingly influential and apply not only to IFC-funded investment but also investment in low income countries from any financial institutions who have signed up to the Equator Principles (a voluntary set of standards for determining, assessing and managing social and environmental risks; Anon., 2013). IFC Performance Standard 6 mandates biodiversity offsets in certain circumstances (Maron et al., 2016a,b) and is likely to drive further spread of biodiversity offsetting. The IFC recommends that projects follow the guidance on biodiversity offsets provided by the Business and Biodiversity Offsets Partnership or BBOP (IFC, 2012a), an international collaboration between companies, financial institutions, government agencies and civil society organisations to develop best practice in biodiversity offsets. The IFC standards themselves provide explicit guidance on mitigating local costs of infrastructure development projects for affected communities (IFC, 2012a). However, there has been limited research looking at how the potential local costs of biodiversity offsets are considered across the available standards, and how these are interpreted by those involved in the design and implementation of schemes.

Madagascar is a country with very high biodiversity (Myers et al., 2000) and extreme poverty (World Bank, no date). The mining sector is expanding rapidly (Canavesio, 2014) and the country has two very high profile internationally-funded mining developments (QMM-Rio Tinto and Ambatovy) which have publicly declared they have achieved respectively net gain (Temple et al., 2012) or no net loss (von Hase et al., 2014) of biodiversity. A recent study (Bidaud et al., 2017) investigated the local impacts of the offsets implemented by Ambatovy. This shows that while the development activities associated with the offset were positive and well-received locally, those benefiting were often not the same people as those bearing the cost due to restrictions to land access and natural resource use. Overall Bidaud et al. (2017) illustrate that some very poor people have lost out as a result of the offset.

In this paper we review how the potential local costs from biodiversity offsets implemented in low income countries are considered in international standards and how these standards are interpreted by stakeholders. Using the case of Madagascar's national policies towards biodiversity offsets, and the implementation of the offsets carried out by Ambatovy, we then argue that while international standards, and their incorporation into national policies, both make clear the need for local costs to be mitigated, this does not always happen in practice. We use detailed interviews with international and national stakeholders to explore the reasons for this gap between policy and practice. We offer recommendations for how the implementation of biodiversity offsets can be improved to ensure potential negative impacts on local people are mitigated.

2. Methods

2.1. Review of international standards, national and company policies for biodiversity offsets

We reviewed the IFC Performance Standards and BBOP Standards (to which the Ambatovy mine has signed up), noting the commitment to biodiversity offsets, the way in which local costs are considered (focusing especially on the impacts on livelihood, on poverty and vulnerability and equity issues), and the requirement for compensating local people for economic displacement. In relation to equity, we mainly discuss the distributive dimension, with less attention to contextual and procedural dimensions (McDermott et al., 2013).

We reviewed Madagascar's national policies with relevance to biodiversity offsets including the Mining Code (2005) and its revision (draft dated March 2016), the law regarding the impact of large investments on the environment (the MECIE decree, 2004), environmental policies governing decentralization of natural resource management (GELOSE 1996 and GCF 2001), and the Protected Area Code (République de Madagascar, 2015).

We reviewed publicly available information from Ambatovy, such as their environmental impact assessment, annual reports to the National Environment Office (ONE), sustainability reports, BBOP reports, and monthly newsletters.

2.2. Interviews with key stakeholders

We conducted semi-structured interviews with international stakeholders expected to be well-informed about biodiversity offsets because they were involved in developing biodiversity offset standards, engaged in the debate around biodiversity offsets, or implementing biodiversity offset schemes in low income countries. Informants were selected to reflect the range of international stakeholders involved in the design and implementation of schemes: lenders, consultants, international conservation NGOs and academics. We targeted experienced and relatively senior people who had often authored influential documents or play a decision-making role in their organisation. We developed an initial list of individuals and organisations we would like to interview based on our extensive reading in this area. We built on this list during the research process as those approached to interview (both those who accepted and those who declined) often suggested additional contacts. After background checks to ensure these suggested people met our criteria, they were approached. In total we attempted to contact 60 international stakeholders for interview, but some did not respond to our contact, passed us onto someone else within their organisation, or felt they were not qualified to answer our questions. A total of 30 interviews were carried out between August 2015 and May 2016 (coded from IS01 to IS30 in Appendix A in Supplementary material, and where quotes are presented in the text). Interviews were conducted mostly face to face (in Washington, London, Cambridge and at an International Conference in Montpellier) but some were conducted over skype. Interviews covered: interpretation of IFC standards, experience of biodiversity offset implementation, who should be considered as 'affected by the project', and how costs and benefits should be distributed (for full details of the interview guide see Appendix A in Supplementary material). At the end of the interview we presented the results from our earlier research exploring the impact of the biodiversity offsets in the Ambatovy case study in Madagascar on local people (Bidaud et al., 2017). This research shows a significant gap between the standards and their implementation as, while the micro-development projects implemented as part of the scheme are well received, they deliver too small benefits, too late and not targeted to the people bearing the greatest cost. After presenting these results we asked interviewees for their perceptions of the reasons for the existence of this gap.

We also conducted 20 semi-structured interviews with national stakeholders working at regional and national levels in Madagascar in the mining, development and conservation sectors with experience of biodiversity offsets (coded NS01 to NS20 in Appendix A in Supplementary material). These interviews were all carried out face-to-face in Madagascar in October and November 2014, February and March 2015 and in January 2016. Because it was not possible to agree the terms of a Memorandum of Understanding between Ambatovy and Bangor University with respect to publication of research results, we could not interview Ambatovy staff.

All interviews were conducted in English or French, recorded using an MP3 recorder, transcribed and coded in NVivo by CB. CB is a native French speaker and fluent in English. The research was approved under the Bangor University research ethics framework. We do not give information which allows individual quotes to be attributed to our respondents.

2.3. Introduction to the Ambatovy case study

Ambatovy is a nickel and cobalt mining company representing the largest ever investment in Madagascar (over 7 USD billion) and one of the largest in sub-Saharan Africa and the Indian Ocean region (Ambatovy, 2014). Ambatovy estimates that its contributions to the Government of Madagascar will be US$ 50 million per year for the next ten years and total US$ 4.5 billion in taxes, royalties, duties, and other payments over the 29 year lifetime of the mine[2]. Nickel is predicted to be among Madagascar's most valuable exports and to bring a large amount of tax revenue to this very poor country.

As well as bringing jobs and much needed tax revenue, the mine is also destroying 2065 ha of natural forest (which provides critical habitat for globally threatened species) both in the mine footprint and along a 220 km pipeline moving material from the mine to the coast for export (von Hase et al., 2014). Ambatovy launched a biodiversity offset programme early in its development to compensate the negative impacts on forest and "*deliver no net loss and preferably a net gain, of biodiversity*" (Ambatovy and BBOP, 2009). The Ambatovy offset portfolio (see Fig. 1) comprises a range of protected areas including the recently created Corridor Forestier Analamay Mantadia, and older protected areas (Ankerana and Torotofotsy). Some areas are contiguous with the mine footprint (mine concession conservation zone and Torotofotsy) but Ankerana is 70 km away on an outcrop of similar soil type (von Hase et al., 2014). Much of the area in which the biodiversity offsets are implemented is difficult to access and remote, people have a generally low level of literacy and distrust of the state is common (Bidaud et al., 2017).

3. Results

3.1. Biodiversity offset standards and policies relating to local costs

3.1.1. International standards

In the case of project-related land acquisitions and restrictions on land use, Performance Standard 5 of the IFC is very clear that anyone who is displaced physically or economically (this includes people whose livelihood must shift due to the implementation of IFC-funded conservation) should be compensated for their loss. "*When displacement* [includes economic displacement and physical displacement] *cannot be avoided, the client will offer displaced communities and persons compensation for loss of assets at full replacement cost and other assistance to help them improve or restore their standards of living or livelihoods*" (IFC, 2012a, p3 PS5). In IFC Performance Standard 6 (which covers impacts of development on biodiversity and which introduces the requirement for biodiversity offsets), there is a suggestion that clients 'may' compensate local stakeholders for the loss of access to land or resources resulting from biodiversity offsets: "*In addition, where socioeconomic and cultural uses of biodiversity (i.e., ecosystem services) are at issue, biodiversity offsets may include the provision of compensation packages for Affected Communities impacted by the development project and offset*" (IFC, 2012b, Guidance Note 6, GN31 p11). This therefore suggests that those affected by the biodiversity offset might not be eligible for compensation. However, guidance notes clarify that biodiversity offsets are also covered by Performance Standard 5: "*Impacts not directly related to land transactions, such as restrictions on land use resulting from the creation of project-related buffer zones or biodiversity offsets* […] *should be mitigated and compensated for according to the principles of the Performance Standard*" (IFC, 2012b, Guidance Note 5, GN20, p8).

Careful reading of Performance Standards 5 and 6, together with their guidance notes, therefore makes clear that those negatively affected by biodiversity offsets should be compensated for those costs. However, inconsistencies between the wording of the two standards and their guidance notes (use of 'may' in PS6 and 'should' in PS5) may lead to confusion among clients and consultants about the extent to which those affected by biodiversity offsets are eligible for compensation. Reading PS6 alone could lead to the requirement to compensate local stakeholders being missed as all relevant details are confined to the guidance notes of Performance Standard 5.

The BBOP standards acknowledge that biodiversity offsets may have negative impacts on local stakeholders, and the need to ensure that the benefits outweigh the costs. The guidance provides methods for determining and comparing costs and benefits, though stating that they depend very much on the scale of the project, the nature and scale of the residual impacts and the context. The guidance also acknowledges the importance of ensuring that such estimates are locally acceptable and credible (BBOP, 2009, p12).

Both IFC and BBOP highlight the need to consider the needs of the most vulnerable. As part of the World Bank Group, IFC's aim is to end extreme poverty and there are a number of references throughout the Performance Standards and associated guidance notes to ensuring that vulnerable people and those in extreme poverty get special consideration. BBOP lists equity (defined as "*the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way*") as one of its key principles. BBOP has also produced a guide to specify a fair and effective offset package, which includes consideration of "*sub-groups within local stakeholder groups that need special attention*" (BBOP, 2009, p19).

3.1.2. Malagasy national policies

Madagascar's mining code is under revision and there is no mention of biodiversity offsets in the work-in-progress version (from March 2016). The social impacts of mines are considered however. Any company embarking on a new development will be required to conduct an environmental and social impact assessment (République de Madagascar, 2016). This is in contrast to the environmental impact assessment which was required in the previous version of the code (République de Madagascar, 2005). The National Environment Office (ONE) is in charge of issuing permits and monitoring compliance with companies' commitments in their impact assessments.

Biodiversity offsets are mentioned in the 2015 protected area management code. In order to proceed with development within a protect area, companies will have to apply to declassify the protected area and to identify areas of a similar size in a similar ecosystem and with similar levels of biodiversity to actively conserve as a biodiversity offset (République de Madagascar, 2015). While most natural forests in Madagascar are covered by some form of legal protection, few of these are effectively managed or have sustainable funding. This has been used to justify setting up biodiversity offsets in areas which are already legally protected (von Hase et al., 2014). Biodiversity offsets are required to follow the code for protected area management in the same

[2] Ambatovy website accessed November 2017 http://www.ambatovy.com/docs/?p=430

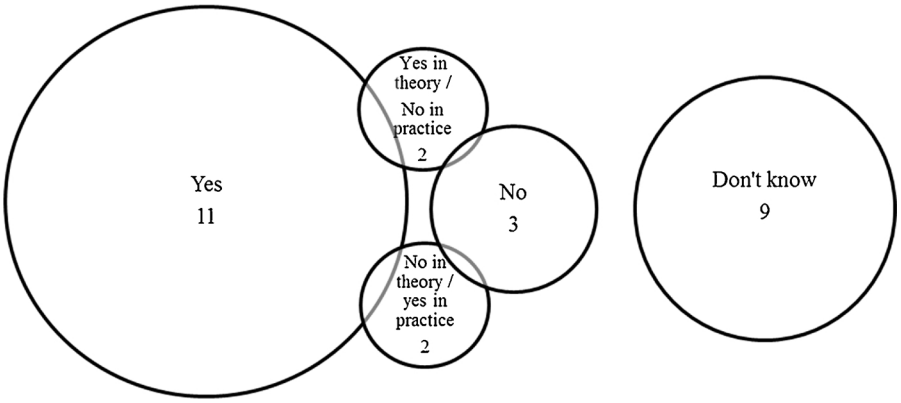

Fig. 1. Responses from international stakeholders to the question: "In IFC standards, local communities directly affected by a development project are called 'affected communities'. Does this term also apply to those affected by the offset?" (n = 27).

way as other protected areas. The protected area code explicitly mentions that measures must be undertaken by the manager in order to compensate local stakeholders for the loss of access implied by the new status of the area (République de Madagascar, 2015). An additional document (Ministère de l'Environnement de l'Ecologie et des Forêts, 2014) provides more detail and includes the key indicators to ensure that local stakeholders have been compensated for lost economic opportunities due to the new protected area. These guidelines also highlight the need to specifically consider the most vulnerable people.

Policies and national guidelines in Madagascar therefore guarantee the rights of local stakeholders living around a protected area (including biodiversity offsets) to access alternative livelihood activities to compensate for their loss of access to forest resources (Ministère de l'Environnement de l'Ecologie et des Forêts, 2014). These national policies relating to biodiversity offsets are therefore coherent with international standards; acknowledging the need to compensate local stakeholders for impacts of biodiversity offsets and the need for special consideration for the poorest people.

3.1.3. Application of international standards and national policies to the Ambatovy case study

The Ambatovy mine received its environmental permit in 2006 and is monitored each year under the supervision of the ONE. As it has funding from a consortium of international development banks, export credit agencies and commercial banks, Ambatovy is required to follow the IFC Performance Standards. Its compliance with these standards is audited regularly by independent third-party experts who represent the lenders.

Ambatovy joined BBOP in 2006 "to seek guidance for its own operations and, more broadly, to help pioneer and improve best practice in biodiversity offset design" (von Hase et al., 2014, p18). The BBOP voluntary standards are seen as very stringent and so following these also ensures compliance with national laws and international requirements (NS10). The company has also been working closely with the Malagasy government to develop the national laws in both the mining sector and the environmental sector. For example they were involved in drafting the standards and norms for social safeguards of new protected areas (Ministère de l'Environnement de l'Ecologie et des Forêts, 2014).

Early on in the development of their biodiversity offset programme, Ambatovy identified that local communities are dependent on natural resources and that this dependence is the main threat to the forest. They acknowledged that there would be socio-economic impacts of the offset project locally and that these would need a carefully designed mitigation plan: "*Biodiversity resources within the mine region have strong intrinsic and use values and communities there largely depend on these biodiversity resources for their livelihoods. […] The socioeconomic impacts on the local communities from the project's offset programme will need to be considered. The mitigation of these impacts needs to be designed in the context of national, regional and communal plans that address long-term issues of sustainable resource use […].*" (Ambatovy and BBOP, 2009, p12).

Ambatovy committed to developing a programme to compensate local stakeholders for lost access to natural resources around the biodiversity offset sites. However, there is no mention of a special programme for the poorest or most vulnerable in Ambatovy's literature. The mitigation plan involves a diverse range of alternative livelihood projects such as training in improved agriculture and livestock raising techniques, providing seeds, tree seedlings and agricultural equipment, supporting communities in getting tenure of their forests through community forest management and funding to support community-based ecological monitoring. At the same time there was also investment in education and awareness about rules governing natural resource access, and funding for local law enforcement agents to come to the area to enforce the environmental protection rules (von Hase et al., 2014, p43).

3.2. Evidence for an implementation gap between standards, policy and practice in the Ambatovy case study

We have demonstrated two main principles regarding the social impacts of biodiversity offsets arising from the international standards and national policies. The first is that natural resource access restrictions should be compensated. The second is that the poorest people deserve special consideration.

In a study linked to this one, we undertook extensive field research in four sites affected by Ambatovy's biodiversity offsets to assess the magnitude and distribution of positive and negative impacts of the biodiversity offset project on local wellbeing (Bidaud et al., 2017). This work, conducted between October 2014 and November 2015, involved extensive qualitative (53 key informant interviews and 29 focus group discussions) and quantitative (170 household surveys covering the costs and benefits of the biodiversity offset scheme as experienced by households) research. We showed that although it acknowledged the livelihood dependence of local people on natural resources and provided micro-development projects to support alternative livelihoods, Ambatovy's biodiversity offset programme faced critical social issues. Firstly, though acknowledging the positive impact of some of the development projects on their lives, local stakeholders felt that they had suffered a net cost from the biodiversity offset as the benefits from the alternative livelihood activities did not compensate for the costs of the conservation restrictions. Secondly those who benefited most from the development projects were neither those who bore the greatest costs of forest access restriction nor the poorest people, but tended to be those with more power locally (Bidaud et al., 2017). We therefore conclude that the compensation provided through Ambatovy's biodiversity offset programme (in the form of alternative livelihood projects) has not

followed the two principles we identify from the international policies and national standards.

3.3. Possible reasons for an implementation gap

The standards and policies governing biodiversity offsets demonstrate that local costs, especially those borne by the poorest, must be identified and compensated. Using the case study of the offsets associated with the Ambatovy mine in Madagascar, we have illustrated (see Bidaud et al., 2017) that there is a gap between standards and policies, and their implementation. When we presented this to international and national stakeholders, many were not surprised, acknowledging that "*there is always a gap between the plan and what happens*" (IS18). From our extensive interviews with stakeholders we identify four possible reasons for this implementation gap regarding the general case (biodiversity offsets in low income countries) but with a focus on the case of Ambatovy.

3.3.1. Differences in the interpretation of standards by stakeholders

Through our review of the international standards relating to biodiversity offsets we illustrated that there was some ambiguity in whether local costs due to economic displacement by a biodiversity offset should be compensated. Interestingly, when approached for clarification, IFC themselves did not see any ambiguity and gave a clear response that the guidelines concerning economic displacement apply to those affected by biodiversity offsets: "*… PS5 would apply to those communities/individuals affected by the biodiversity offset created by a project, if they were to be physically or economically displaced. With respect to conservation restrictions imposed by biodiversity offsets, the loss of access to resources would need to be mitigated also in accordance with PS5*" (IS30). However, when we asked international stakeholders whether, in their understanding, people impacted by an offset should be considered as "affected communities", the specific wording used in the IFC Performance Standards to refer to those deserving of compensation for displacement, there was a wide range of views (see Fig. 1).

The most common response was that IFC standards concerning project affected communities do indeed apply to those affected by biodiversity offsets: "*Yes my understanding is that as for biodiversity impacts and social impacts it is the same thing. Both direct and indirect impacts are included. The overall project activity includes supply chain and downstream activities so there is no reason why biodiversity offsets would be different*" (IS28).

However, three interviewees believed otherwise: "I think it is unclear but implicit is affected means affected by the direct destructive activity and not extended to those affected by the biodiversity offset" (IS27). This view was shared by one of the NGO staff interviewed: "I guess my interpretation of the language would be that generally speaking the World Bank and IFC interpret the language as narrowly as they can justify" (IS09).

Some of these well-informed stakeholders explicitly acknowledged the disconnection between the theory and the practice. Some people felt that, although in theory those affected by the biodiversity offset should be considered affected by the project, in reality they were not treated that way: "*It is a bit complicated, […], I think formally, I think they should […] but at the same time I don't think we necessarily apply the performance standards to the offset from what I have seen*" (IS11). Others felt that although the wording about affected communities should not apply to those affected by biodiversity offsets, in practice such communities are often dealt with in the same way as those affected by the main development: "*We would not apply the official term of affected communities but I think many of the same principles would apply*" (IS18).

Some informants suggested that the local costs of biodiversity offset schemes are limited or could be avoided by operating in areas which are already officially protected: "*One of the easiest ways* [to implement biodiversity offsets] *is to invest in existing protected areas where we would hope that social issues or conflicting issues related to that area have been addressed in the past or will be addressed as part of the management programme […]*" (IS28). This represents an interesting contradiction because if the conflicting issues had been resolved (meaning people must have moved away from livelihoods dependent on expanding agricultural land or hunting) then there would presumably be limited biodiversity benefits from the offset.

3.3.2. Weak incentives for applying policies effectively

Because of Ambatovy's commitment to achieve 'no net loss of biodiversity' through its biodiversity offsets, the implementation of the offset scheme supposedly forms part of the compliance audits regularly conducted by third-party experts who report to the lenders (von Hase et al., 2014, p4). However, although informants emphasised the requirements of IFC for robust monitoring, they acknowledged that poor access means that site visits are rare and the auditors rely on the company's own monitoring systems: "*IFC requires robust monitoring on biodiversity and social issues. Auditors look for good monitoring systems on which they can count on results for evaluation. Obviously they do a field visit if they have time*" (NS10).

It is clear that although lenders and companies commit to IFC performance standards, lenders are limited in the pressure they can put on a company once the loan is disbursed, especially if the company is suffering financial difficulties: "*That is something that Ambatovy has to in principle rectify if they are not in line with the IFC Performance Standards. […] However I don't know how much leverage at this point of time we have until the financial situation resolves itself. […] It needs a strong commitment behind the offset from government*" (IS22).

Ambatovy believes that its "*offset programme goes above and beyond compliance with legal obligations"* (Ambatovy and BBOP, 2009, p11). However, although the offsets were initially a voluntary activity, they were included in the Environmental Impact Assessment on the basis of which the company received its environmental permit. Therefore the conservation of the offset sites (such as the Ankerana protected area) is part of the legal obligations of Ambatovy toward the Malagasy government and should therefore be subject to regular monitoring. The extent to which Ambatovy's offset programme is subject to national compliance monitoring in the same way as the rest of the mine's activities is however unclear. The management of the Ankerana site is monitored by Ambatovy and reported to the ONE every year[3] but the ONE itself does not visit this difficult-to-reach area. Interviews with senior members of ONE staff suggest that they view the biodiversity offset as a 'bonus' (because it was included in the EIA as a voluntary measure) and so they put more emphasis on monitoring the main project's impact. Furthermore, some key national stakeholders consider that the mining company is not responsible for any social issues arising from the management of the protected area: "*Economic displacement relates to especially the mine and factory implementation but not to the conservation project. For the implementation of Corridor Ankeniheny Zahamena* [the protected area of which Ankerana is part]*, Conservation International* [the international NGO managing the protected area] *is solving it. So for the protected area implementation there are restrictions. Responsibility lies with the manager and not Ambatovy. For local people affected by conservation, Conservation International is in charge*" (NS15).

A national stakeholder we interviewed suggested that any failure to deal with local costs of conservation was due to a failure of local people to complain "*The problem with Malagasy people, they don't talk to you but behind your back. When you are around, everything is fine. There is not the culture of sending a letter to Ambatovy. If you say 'when you have complaints, go to Ambatovy's office', they do not come"* (NS11). However, as civil society is weak, and rural people affected by development projects struggle to get their voice heard (Kraemer, 2010), perhaps it is unsurprising that complaints rarely reach the ear of those in control.

[3] Ambatovy annual reports to ONE from 2010 to 2016 are available here http://www.ambatovy.com/docs/?p=506

3.3.3. The separation of responsibility for environmental and social impacts within organisations

In many organisations there is separation between those with environmental expertise and responsibility and those concerned with social impacts (whether companies, consultancies, NGOs or within the National Environment Office). Biodiversity offsets are usually managed by the environment team within a company and they may not have the expertise to consider social impacts. Those in the social team may not consider that biodiversity offsets come under their remit at all as they consider it to be a purely environmental intervention. Consultants specialising in biodiversity offsets are mainly environment specialists. Hence the consideration of the local costs of conservation activities may not be adequately considered and any development activities (seeking to compensate or move livelihoods to more sustainable options) may be poorly designed. One respondent from an international lender said: "*[*The social component*] is too weak in biodiversity offsets because only biologists are working on it. Very often there is no social and community development expert involved*" (IS11). A respondent from an international conservation NGO said: "*I feel like the social impacts are always lagging behind the biodiversity valuing in terms of offset design*" (IS15).

Because local stakeholders' dependence on natural resources is a cross-cutting issue between the social and the environmental, considering them separately may cause problems. Some stakeholders involved in the implementation of biodiversity offsets complained that they were not encouraged to engage with communities at an early stage to avoid raising expectations: "*I was involved in a project to design a biodiversity offset and they were paying a lot of attention to the biodiversity values, habitat… and we said 'we need to understand communities' use values ('what are they using?') to make sure that gets integrated into that calculation. And they said 'we can't engage with stakeholders yet because we don't want to raise expectations'."* (IS15).

One informant made the point that there is a general tendency for the evaluation of social impacts of interventions (whether mines or conservation projects) to lag behind environmental impact evaluation in Madagascar: "*What is sure is that environmental impact assessment has always been a preoccupation of the international community and in some way of the Malagasy government. But social impact started later. I don't think there are many evaluations of the impact of those projects* [….] *on communities. It is surely a weakness of the environmental community, to have integrated the social component late in the thought process*" (IS14). This is supported by the fact that social impacts were included only recently into the mining code.

Though many key stakeholders emphasised that the development of biodiversity offset projects has over-emphasised the biodiversity concerns, there was some suggestion of a shift: "*One of the key things was trying to reduce the emphasis of calculation and accounting* [of biodiversity equivalence] *to focus more on engaging with stakeholders and finding practical solutions. In some cases, we find that we don't need the accounting stuff*" (IS18).

3.3.4. The assumption that conservation projects are a 'good thing'

stakeholder interviews suggested that the standards are interpreted as assuming that the conservation activities of the biodiversity offset are generally good for everyone concerned: "*The standards assume that the offset is going to be good for people*" (IS05); "*… when you look at the description of biodiversity offset in the IFC materials they start by assuming that the activity implemented will have a beneficial impact not only for biodiversity but also for people*" (IS27).

Some informants were reluctant to talk about negative impacts and sought to highlight potential local benefits derived from biodiversity offsets. An informant interviewed after we had presented our work on local perceptions of the impact of the Ambatovy offsets (Bidaud et al., 2017) said: "*So you make the implicit hypothesis that people are excluded from their forest. This intrigues me. I would rather think that offsets are considered as positive for the communities as they allow better management of the natural resources upon which they depend so I find your position surprising as I would rather think it is a work with the community to protect the forest*" (IS25). Other informants clearly felt that it was not helpful to think of biodiversity offsets as having negative impacts as the resource use the offsets seek to prevent is unsustainable and so, in facilitating a shift to alternative livelihoods, the offset's conservation actions are positive in terms of local impacts.

One informant felt strongly that biodiversity offsets should be viewed as a positive action and that it was somehow unfair to highlight possible negative impacts: "….*we are trying to do something good here and* [local] *people are … 'throwing it up'. It is their fault. They are messing up something good we are trying to do*" (IS23).

4. Discussion

The extent to which conservation funded by biodiversity offsets is truly additional is an important criticism of the approach (de Freitas et al., 2017; Koh et al., 2017). If funding for conservation from offsets displaces other conservation funding (from governments, NGOs or private donors) then the biodiversity losses from infrastructure developments are not compensated. The funding of protected areas by biodiversity offset schemes is particularly controversial for this reason (Githiru et al., 2015; Kiesecker et al., 2015; Maron et al., 2015b, 2016a,b; Pilgrim and Bennun, 2014). It is interesting that we have found stakeholders claiming that there are no local costs of establishing the biodiversity offsets in the parts of the Ambatovy portfolio which are legally protected areas, as farming and hunting are already illegal in the area. There is a clear internal contradiction here. If a site's protected area status means it does not face threats, then there are no biodiversity benefits from the biodiversity offset. If the protected area does in fact face threats from land encroachment or natural resource extraction then, by definition, there will be local costs to changing people's livelihoods away from current activities.

In many low income countries, where biodiversity offsets are increasingly being established (Maron et al., 2015a), local people are often heavily dependent on natural resources. We have made the case, based on extensive document review, that international standards which underpin the development of biodiversity offsets are clear that impacts on these people should be considered and mitigated. Our previous work (Bidaud et al., 2017) shows that this is not being achieved. Although we focus on Ambatovy, we suggest that the case is not isolated. The impacts of the biodiversity offset implemented by Rio Tinto, the other big mining company operating in Madagascar using biodiversity offsets, have also faced criticism about their impact on local people (Kill and Franchi, 2016; Seagle, 2012). We would suggest that similar local costs are likely wherever biodiversity offsets generate biodiversity benefits by preventing land clearance or wildlife use by local people, but this has not been extensively studied. A current project is looking at the social impacts of the biodiversity offsets associated with a major dam in Uganda[4].

The first reason we suggest for the gap between excellent progressive policies which clearly consider the potential impacts of biodiversity offsets on the poor, and the implementation of these policies, is simply a lack of understanding of the requirements of the standards underpinning biodiversity offsets with respect to identifying and mitigating local costs. Effective policy implementation requires a shared understanding of objectives (Hogwood and Gunn, 1984). However, in this case the relevant texts are quite complex with key phrases hidden in guidance notes rather than explicitly stated in the standards themselves. It would be possible for those developing biodiversity offsets to miss the requirement in the IFC performance standards to consider those affected by biodiversity offsets in the same way as those affected by the development itself.

[4] https://www.iccs.org.uk/project/achieving-no-net-loss-communities-and-biodiversity-uganda

The second reason we suggest for the gap is weak incentives for applying policies effectively. Consultants have limited time to investigate complex social issues such as local costs of the offset, and lenders may not be aware of the issues and have little leverage to impose better monitoring on the borrower (this appears to be the case with Ambatovy which is in financial difficulties due to the drop in nickel price). The state may also have insufficient capacity to properly conduct the monitoring required to ensure compliance with its own policies and international standards. A recent review of the implementation of biodiversity offsets in Uganda (Esmail, 2017) has revealed that while responsibility for oversight was held by the government of Uganda, no clear plan for implementing the offset was developed and there was a failure to ensure the commitments both in terms of environmental and social impacts from the dam project and its associated offset were met. The lender, in this case the World Bank, are currently conducting a review. Of course this is not just a problem in the context of biodiversity offsets: experience from a number of countries shows similar findings that lack of effective formal institutions for monitoring at the government level can result in progressive policies in the water and forest sectors not being properly implemented (Kairu et al., 2017; Pahl-Wostl et al., 2012). At the same time, the ability of local communities to demand accountability can be severely limited by a number of factors such as low levels of education and the lack of a strong NGO sector (Agrawal and Ribot, 1999). Rural Malagasy people living in remote areas may not be aware of their rights and have limited negotiating power at the national level (Corson, 2016; Rakotonarivo et al., 2018), therefore they may be unlikely to appeal against poor implementation of standards requiring their costs to be compensated. Previous work in Madagascar has illustrated that despite clear commitments to mitigation of economic costs incurred due to the new protected areas, compensation mandated under World Bank social safeguards often does not reach the right people (Poudyal et al., 2016).

The third reason is the separation within organisations of those responsible for environmental issues and those responsible for social impacts. Biodiversity offset schemes have been developed mainly by those with environmental expertise and through a biodiversity conservation lens (Benabou, 2014). Our work suggests that those considering the social impacts of the development simply did not consider the biodiversity offsets (and any social impacts therefore) to come within their remit. The fact that protected areas may bring significant costs to local people has been well documented (Brockington and Wilkie, 2015; Holmes and Cavanagh, 2016; Oldekop et al., 2016). It is important that those responsible for social impacts of developments recognise that mitigation of costs caused by the biodiversity offsets should be considered alongside the other costs of the development.

Finally, it is clear that many of the stakeholders we interviewed see biodiversity offsets as positive actions and are unwilling to acknowledge the very real potential local costs. Because the impacts of large-scale land investments (including mining and protected areas) are typically framed based on assumptions of what the investors (government and private sector) consider to be important, assessments of those impacts may be shallow and ignore deeper implications for local communities (Zoomers and Otsuki, 2017). This is a wider issue as conservation activities tend to be seen as positive actions by society and so may receive reduced scrutiny relative to other activities which influence the lives of remote, rural communities. While it is of course true that the very rationale for conservation often includes the benefits which come to society from natural ecosystems (ecosystem services), the reality is that while conservation mainly delivers regulating and cultural services, it may prohibit the use of provisioning services and hence result in local costs (Howe et al., 2014). It is certainly concerning that many of those intimately involved in the design of these schemes, which have very real impacts on local livelihoods (Bidaud et al., 2017; Seagle, 2012), do not appear to recognise these local costs.

5. Conclusion

Biodiversity offsets have rapidly expanded in popularity across the world. The international standards which underpin their implementation in developing countries have clear commitments to avoiding local costs through compensating for economic displacement and ensuring special consideration of the poorest and most vulnerable. These principles are reflected in relevant national policies in Madagascar, a country with a number of high profile biodiversity offset projects. Unfortunately there appears to be a significant gap between the standards, which demonstrate high consideration of the local costs of biodiversity offsets, and the implementation. Achieving the very high standards laid out in the various policy documents is understandably challenging in the context of difficult access to communities, limited economic opportunities locally due to poor connection to markets, and a low level of literacy. However if biodiversity offsets are to be a successful addition to the conservationist's toolkit in high biodiversity, low income countries, then the challenges of addressing the local costs of this novel conservation approach need to be resolved. Local costs of biodiversity offsets are not inherently different to those arising from traditional protected areas. The existence of stringent standards concerning mitigation of local costs by companies implementing biodiversity offsets is a very positive first step. However, as we have shown, companies involved in implementing offsets need to recognise that people affected by biodiversity offsets should be considered in the same way as those affected directly by the project. The social impacts of offsets will therefore need to be considered at a much earlier stage. Further, we argue that lenders need to ensure capacity is in place to ensure there is appropriate oversight to ensure commitments are met. Future biodiversity offset projects in low income countries need to work closely with local communities from the start to effectively identify appropriate mechanisms to ensure some of the poorest people in the world don't bear the cost of conservation.

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Appendix A. Supplementary data

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